Watch. Practice. Understand. | Lesson 302

Calculus Integration by Using U-Substitution

Watch the matching video: https://www.youtube.com/watch?v=RgSAdTPOLQA

Practice focus: Integration by substitution

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 Integrate $2x(x^2+1)^3$ dx.

02 Integrate cos(3x) dx.

03 Evaluate the integral of 2x e^(x^2) from 0 to 1.

04 Integrate $x/(x^2+4)$ dx.

Worked answers | Lesson 302

Calculus Integration by Using U-Substitution

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Practice focus: Integration by substitution

Original extra practice matched to the listed lesson topic.

01 Integrate $2x(x^2+1)^3\,dx$.

Let $u=x^2+1$, $du=2x\,dx$. Integral $u^3\,du = u^4/4+C = (x^2+1)^4/4+C$.

02 Integrate $\cos(3x)\,dx$.

Let $u=3x$. Result $(1/3)\sin(3x)+C$.

03 Evaluate the integral of $2x\,e^{(x^2)}$ from 0 to 1.

$u=x^2$ changes bounds to 0 and 1. Integral $e^u\,du = e-1$.

04 Integrate $x/(x^2+4)\,dx$.

Let $u=x^2+4$, $du=2x\,dx$. Result $(1/2)\ln(x^2+4)+C$.